

wherein the planar sensor element is formed using a sintering process, wherein, before the layer structure is sintered, the electrically functioning layer includes at least two [function layer-side] foils and the electrically non-functioning covering layer includes at least one [cover foil-side] foil, the [cover foil-side] foil having a predetermined thickness, and wherein a total thickness of the at least two ^{electrically functioning layer} [function layer-side] foils is at least approximately equal to the predetermined thickness. ^{covering layer}

REMARKS

Claims 1 to 7 remain pending in the present application. In view of the above amendments and the following remarks, it is respectfully submitted that all of the presently pending claims are allowable, and reconsideration is respectfully requested.

Claims 1 to 7 were rejected under 35 U.S.C. § 112, second paragraph as indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. In this regard, the Examiner will note that claim 1 has been amended herein to recited an electrically functioning layer and an electrically non-functioning covering layer. It is believed that the amended claims fully comply with the requirements of 35 U.S.C. § 112, and withdrawal of this rejection is respectfully requested.

Claims 1 to 5 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 4,505,806 ("Yamada '806") or U.S. Patent No. 4,505,807 ("Yamada '807"). It is respectfully submitted that neither Yamada '806 nor Yamada '807 anticipates the present claims as amended herein for the following reasons.

Claim 1 relates to a planar sensor element for determining at least one gas component. The sensor element includes a layer structure. As indicated above, claim 1 has been amended herein to recite that the layer structure includes an electrically functioning layer and an electrically non-functioning covering layer. The layer structure further includes a heating element disposed between the electrically functioning layer and the electrically non-functioning layer. The sensor element according to the present claims has several advantages, including improved resistance to temperature variations and thermal shock and enhanced efficiency of the heating element. See, for example, page 2, lines 1 - 3 of the Specification.

Yamada '806 describes two embodiments of an oxygen sensor. In the second embodiment, two intermediate board members 7b are disposed between two board members 7a. Each of the intermediate board members includes a heat generating resistor 16a. One of the outer two board members 7a defines an oxygen pump element, and the other of the outer two board members 7a defines an oxygen concentration cell element. Clearly, each of these board members defines an electrically functioning member. That is, neither of these board members defines an electrically non-functioning covering layer as recited in claim 1. The Examiner's interpretation that the pump element is a "non-functioning" layer cannot be maintained in view of the recitation of an electrically non-functioning layer in amended claim 1. Each board member 7a, 7b is stated to include lead wires 16b and heat-generating resistor 16a. Furthermore, Yamada '806 specifically states that "a heating electric current is applied to the heat-generating resistor 16a through the outside lead wires 10' connected to the lead wires 16b." Col. 6, lines 56 to 58. Thus, neither board member can be properly read as an electrically non-functioning layer. Therefore, because Yamada '806 fails to describe each and every element as set forth in claim 1 as amended herein, such claim is not anticipated thereby. Verdegaal Bros. v. Union Oil Co. of Calif., 814 F.2d 628, 631 (Fed. Cir. 1987).

Similarly, Yamada '807 describes an oxygen sensor, which includes an oxygen concentration cell element 1, an oxygen pump element 2 and a heater element disposed therebetween. Neither the oxygen concentration cell element 1 nor the oxygen pump element 2 defines an electrically non-functioning covering layer as recited in claim 1 as amended herein. Accordingly, Yamada '807 fails to anticipate claim 1 as amended herein. Id.

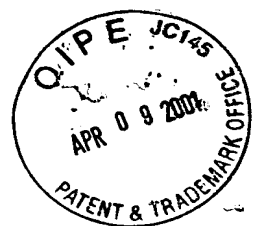
As for claims 2 to 5, which ultimately depend from claim 1, it is respectfully submitted that these claims are patentable for at least the same reasons given in support of the patentability of claim 1.

Claims 1 to 7 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 5,529,677 ("Schneider et al.") in view of Yamada '806 or Yamada '807.

Obviousness of a claimed invention can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion or motivation to do so found either in the references

themselves or in the knowledge generally available to one of ordinary skill in the art. In re Fine, 837 F.2d 1071 (Fed. Cir. 1988). That certain references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. In re Mills, 916 F.2d 680 (Fed. Cir. 1990). Contrary to the Examiner's position, none of the cited reference provide the required teaching, suggestion or motivation to combine the references as proposed. The Examiner states that "[i]t would have been obvious to Schneider to locate the heating layer about half way between the top layer and the bottom layer in view of either Yamada, because such a heater location would permit equal distribution of heat to all portions of the sensors and minimize temperature gradient that may cause inaccurate measurement." However, none of the references relied upon refer to or discuss the desirability of an equal distribution of heat or of the minimization of temperature gradients. The teaching or suggestion to make the proposed combination must be found in the prior art and not based on the Applicants' disclosure. In re Vaeck, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). The present rejection is clearly based on the Applicants' own disclosure and should therefore be withdrawn. For at least the foregoing reasons, the cited references cannot support the obviousness rejection, and withdrawal of the same is respectfully requested.

As for claims 2 to 7, which ultimately depend from claim 1, it is respectfully submitted that these claims are patentable for at least the same reasons given in support of the patentability of claim 1. In re Fine, 837 F.2d 1071 (Fed. Cir. 1988).



It is therefore respectfully submitted that all of the presently pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE."

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Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Claims 1 and 3 have been amended as follows:

1. (Thrice Amended) A planar sensor element for determining at least one gas component, comprising:

a layer structure including:

[a] an electrically functioning layer;

[a] an electrically non-functioning covering layer;

a heating element disposed between the electrically functioning layer and the electrically non-functioning covering layer and generating a heating power, a layer-shaped heating conductor being embedded in the heating element,

wherein the layer-shaped heating conductor is arranged in a layer plane of the layer structure to obtain an at least approximately homogeneous distribution of the heating power over a cross-section of the layer structure.

3. (Thrice Amended) The planar sensor element according to claim 1, wherein the planar sensor element is formed using a sintering process, wherein, before the layer structure is sintered, the electrically functioning layer includes at least two function layer-side foils and the electrically non-functioning covering layer includes at least one cover foil-side foil, the cover foil-side foil having a predetermined thickness, and

wherein a total thickness of the at least two function layer-side foils is at least approximately equal to the predetermined thickness.

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